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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/929,738      | 08/13/2001  | Emilio Casaccia      | CISCP686            | 9020             |

26541 7590 07/01/2003

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| EXAMINER |
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HUGHES, DEANDRA M

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| ART UNIT | PAPER NUMBER |
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3663

DATE MAILED: 07/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/929,738

Applicant(s)

CASACCIA ET AL.

Examiner

Deandra M Hughes

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 21-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 21-25, 28-33, and 38-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Grochocinski (US 2002/0159132 A1 published Oct. 31, 2002). The Examiner has noted the first and second fibers and their respective ends.

Grochocinski discloses:

- *slope compensating fiber (SCF) to 'compensate for the difference in dispersion at different wavelengths', i.e. chromatic dispersion compensating fiber*
- a pump system (14) disposed to inject optical pump energy into a first end of a first fiber segment (side of 210 facing elements 12 and 14) so as to counter-propagate (paragraph [0005]) relative to an optical signal traversing said first fiber segment (210) and second fiber segment (200);  
and

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- an optical filter structure (230) coupled to a second end (side of 210 facing 230) of said first fiber segment (210) and a first end (side of 200 facing 230) of said second fiber segment (200); and
- wherein said optical signal propagates through said optical filter structure from said second fiber segment to said first fiber segment (from Transmitter 10 to Receiver 12), said optical pump energy propagates through said optical filter structure from said first fiber segment to said second fiber segment (from 14 to 10), and said optical filter structure substantially blocks energy at a frequency of said optical signal from traveling from said first fiber segment into said second fiber segment so that Raman amplification is induced in said first fiber segment and said second fiber segment and double Rayleigh backscattering effects are ameliorated (230 is a directional wavelength selector; see paragraphs [0029] and [0033] – [0035]).

With regard to claim 22, see paragraphs [0029] and [0033] – [0035]).

Grochocinski also discloses that the reflector can be a fiber Bragg grating (line 6 of [0035]).

With regard to claims 23-26, the ports of 230 are as follows: the third port is  $R_x$ , the second port is  $T_x$ , and the first port is  $L_x$  (see paragraphs [0029] and [0033] – [0035]).

With regard to claims 28-29, see figure 1.

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Claims 30-33 are merely the normal operating method of the apparatus of claim 21.

For elements not identified in Claim 38, please see claim 21. All other disclosures are as follows:

- means for injecting optical pump energy (14) into a first end of a first fiber segment so that said optical pump energy counter-propagates relative to an optical signal traversing said first fiber segment and second fiber segment;
- wavelength-selective (230) means for reflecting optical energy at a frequency of said pump energy, optical energy at a frequency of said optical signal being absorbed by said wavelength-selective reflecting means (230 is a directional wavelength selector; see paragraphs [0029] and [0033] – [0035]);
- means for directing optical energy exiting a first end of said second fiber segment into a second end of said first fiber segment, for directing optical energy exiting said second end of said first fiber segment into said wavelength-selective reflecting means, and for directing optical energy reflecting from said wavelength-reflective means into said first end of said second fiber segment (230 is a directional wavelength selector; see paragraphs [0029] and [0033] – [0035]).

With regard to claims 39-40, see rejection of claim 22.

***Claim Rejections - 35 USC § 103***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 26 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grochocinski (US 2002/0159132 A1 published Oct. 31, 2002) in view of admitted prior art (figure 3). Grochocinski does not specifically disclose the use of an optical isolator at the input of the optical amplifier configuration for the advantage of blocking counter-propagating radiation. However, figure 3 teaches, as it is well known in the art, the use of an optical isolator to allow for transmission of an optical signal into optical amplifier configuration while blocking counter-propagating signals attempting to exit out of the amplifier via the second end of the first fiber. Consequently, it would have been obvious to one of ordinary skill in the art at the time the invention was made to place an isolator at the input of the amplifier configuration for the advantage of blocking counter-propagating signals thereby reducing amplifier noise.

5. Claims 35 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grochocinski (US 2002/0159132 A1 published Oct. 31, 2002) in view of Kerfoot, III (US 6,320,884 published Nov. 20, 2001). Grochocinski does not disclose that the Raman pump laser (14) injects optical pump signals of first and second frequencies (or wavelengths), respectively. However, Kerfoot teaches the use of Raman pumps at two different wavelengths (1453 nm pump and 1495 nm pump). Consequently, It would have been obvious to one of ordinary skill in the art at the time the invention was made

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to use dual Raman pumps of differing wavelengths for the advantage of wider bandwidth amplification.

6. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grochocinski (US 2002/0159132 A1 published Oct. 31, 2002) in view of Kerfoot, III (US 6,320,884 published Nov. 20, 2001) as applied to claim 41 above, and further in view of Huber (US 5,283,686 published Feb 1, 1994). Grochocinski in view of Kerfoot does not disclose a first fiber grating to reflect a first pump wavelength and a second fiber grating for reflecting a second pump wavelength. However, Huber teaches an optical circulator with fiber Bragg gratings configured to reflect differing pump frequencies (fig. 4, #56, #58, etc.). Consequently, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the circulator/grating reflectors as taught by Huber for the advantage of redirecting the pump signals.

7. Claims 27, 36-37, and 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grochocinski (US 2002/0159132 A1 published Oct. 31, 2002) in view of Bartolini (US 2002/0159131 filed Apr. 27, 2001). Grochocinski does not specifically disclose EDFAs before and after the chromatic dispersion-compensating unit. However, Bartolini teaches EDFAs before and after dispersion compensating fiber wherein signals are Raman amplified (fig. 1, #125 and #126). It would have been obvious to one of ordinary skill in the art at the time the invention was made to sandwich the chromatic dispersion-compensating unit with EDFAs for the advantage of amplifying the optical signals for long-haul transmission.

***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deandra M Hughes whose telephone number is 703-306-4175. The examiner can normally be reached on M-F, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G Black can be reached on 703-305-9707. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9326 for regular communications and 703-872-9327 for After Final communications.

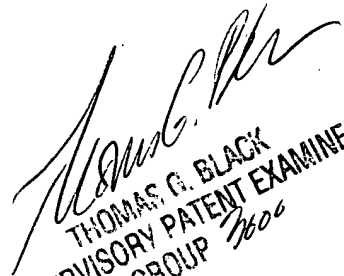


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

DMH

June 23, 2003

  
THOMAS G. BLACK  
SUPERVISORY PATENT EXAMINER  
GROUP 7606